Jonathon D. Tanks

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Polymer Matrix Composites Group
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RESEARCH INTERESTS

My research strategy is to combine experiment and theory—at multiple length and time scales—to probe and explain processing-structure-property relationships in polymeric and nanomaterials at the interface of chemistry and physics and to use those findings to develop high-performance and multifunctional materials and end-of-life recycling/reuse technology, with an emphasis on:

- **Processes for resource recovery and utilization** (commodity plastics/fibers, batteries, biomass, graphite).
- **Designing recyclability into functional materials** (reversible bonding, triggered depolymerization).
- **Development of sustainable energy storage materials** (e.g., biomass, cobalt-/nickel-free, all-solid-state).

EDUCATION

Tokyo Institute of Technology, Tokyo, JP **Mar. 2019**
Ph.D. in Chemical Science and Engineering, *School of Materials and Chemical Technology*
Ministry of Education, Culture, Sports, Science & Technology (MEXT) Graduate Research Fellowship
Thesis title: *Toward the service life estimation of amine-cured epoxy materials: A study on the pH dependence of swelling and degradation behavior.*
Thesis advisor: Prof. Masatoshi Kubouchi
Co-advisor: Prof. Yoshihiko Arao *(Waseda University)*

University of Virginia, Charlottesville, VA **May 2015**
M.S. in Civil and Environmental Engineering, *focus on Materials Mechanics*
Thesis title: *Influence of temperature and stress on the durability of carbon fiber reinforced polymer (CFRP) strands in a concrete environment.*
Thesis advisor: Prof. Devin Harris
Co-advisor: Dr. Stephen Sharp *(Virginia DOT)*

University of Virginia, Charlottesville, VA **May 2013**
B.S. in Civil and Environmental Engineering, *focus on Structural Mechanics*
Dean's List of Distinguished Students, 2012/2013

SELECTED PUBLICATIONS

- J Tanks and K Tamura. Room-temperature material recycling/upcycling of polyamide waste enabled by cosolvent-tunable dissolution kinetics. *Angew. Chem. Int. Ed.*, **2025**, e202502474.
- J Tanks et al. Durable and recyclable biomimetic glycol lignin/polyolefin compounds for a circular economy. *J. Mater. Chem. A*, **2024**, 12, 3014.
- J Tanks et al. Glycol lignin/MAH-*g*-PP blends and composites with exceptional mechanical properties for automotive applications. *Compos. Sci. Technol.*, **2023**, 238, 110030.
- J Tanks et al. Tethering organic disulfides to layered silicates: A versatile strategy for photo-controllable dynamic chemistry and functionalization. *Bull. Chem. Soc. Japan*, **2023**, 96, 65-71. *[Selected Paper]*
- J Tanks et al. Influence of network structure on the degradation of poly(ether)amine-cured epoxy resins by inorganic acid. *Polym. Degrad. Stabil.*, **2018**, 157, 153.
- Y Arao, J Tanks et al. Direct exfoliation of layered materials in low-boiling point solvents using weak acid salts. *Carbon*, **2019**, 142, 261.

RESEARCH EXPERIENCE

National Institute for Materials Science (NIMS), Japan | **Senior Research Scientist** **Apr. 2024–*present***
Polymer Matrix Composite Materials Group | **Research Scientist** **Apr. 2019– Mar. 2024**

- Elucidate structure-property relationships in thermoplastic and crosslinked polymers, including degradation and failure, using spectroscopy, diffraction, microscopy, thermal analyses and mechanical testing.
- Design high-toughness polymer blends and composites by in-situ control over chemical structure and interfacial morphology (*e.g.*, crosslinked aerospace-grade epoxy networks).
- Create high-performance composites using bio-based renewables and establish scalable and efficient recycling technology compatible with their target applications (*e.g.*, lignin/polyamide blends for automotive structures).
- Explore innovative techniques for modifying/processing nanoparticles and their novel applications (*e.g.*, nanosheets with stimuli-responsive functional groups).

Japan Aerospace Exploration Agency (JAXA), Japan | **Technical Trainee** **Jan. 2018–Mar. 2018**
Advanced Structures and Composites Technology Unit, Aeronautical Technology Directorate

- Investigated the effect of ultrasonic welding parameters on the joint strength of thermoplastic composite laminates for lightweight aerospace structures.

Virginia Transportation Research Council (VTRC), USA | **Research Associate** **June 2013–Aug. 2015**
Corrosion-resistant Structures Area, Materials Team

- Studied the environmental durability of carbon fiber composite cables for concrete structures, particularly the effect of tensile stress and alkaline conditions on long-term mechanical properties.
- Developed testing protocols and guidelines for evaluating composite cables/rods, used by state agencies to decide material acceptance criteria.
- Designed a novel mechanical anchorage system for composite cables used in prestressing applications.

RESEARCH GRANTS • PROJECTS *(directly received amount only)*

2025-2028 Japan Science and Technology Agency (JST) Adaptable and Seamless Technology Transfer Program through Target-Driven R&D (A-STEP), "Development of High-Performance Polymers and Nanocomposites for Next-Generation Devices and Structures," **¥37M** ($250,000-$330,000), **PI**.

2025-2028 Japan Society for the Promotion of Science (JSPS) Grant-in-Aid for Scientific Research (C), "Mechanisms of Toughening and Durability Enhancement in Sustainable Nanocomposites," **¥4.6M** ($33,000-$39,000), **PI**.

2025-2028 Japan Society for the Promotion of Science (JSPS) Grant-in-Aid for Scientific Research (B), "Multi-scale Analysis of Clay Nanosheet/Polymer Interface Interactions and Elucidation of Thermo-Oxidative Degradation Mechanism," **¥2M** ($13,000-$17,000), **co-PI** *(PI: K. Tamura, NIMS)*.

2025-2028 Japan Society for the Promotion of Science (JSPS) Grant-in-Aid for Scientific Research (B), "Complex Nano-interface Layers Lead to Higher Strength in Fiber-Reinforced Composite Materials," **¥1M** ($7,000-$9,000), **co-PI** *(PI: Y. Arao, Waseda University)*.

2025-2026 Ministry of Agriculture, Forestry and Fisheries (MAFF), "Development of Recycling and Byproduct Utilization Technologies to Accelerate the Industrialization of Lignin," **¥3M** ($20,000-$26,000), **co-PI** *(PI: K. Tamura, NIMS)*.

2022-2025 Ministry of Agriculture, Forestry and Fisheries (MAFF), "Development of Glycol Lignin-based High-value-added Materials," **¥10M** ($65,000-$85,000), **co-PI** *(PI: K. Tamura, NIMS)*; collaborators include Tendo Co. and Polyplastics.

2022-2025 Japan Society for the Promotion of Science (JSPS) Grant-in-Aid for Scientific Research (A), "Creation of Reusable Mechanical Materials using Nanomaterials," **¥2M** ($13,000-$17,000), **co-PI** *(PI: Y. Arao, Waseda University)*.

2022-2025 New Energy and Industrial Technology Development Organization (NEDO), "Development of Hybrid Polymer Matrix Composite Materials for Lightweight Liquid Hydrogen Tanks," **¥2M** ($13,000-$17,000), **co-PI** *(PI: K. Naito, NIMS)*.

2020-2023 Japan Society for the Promotion of Science (JSPS) Grant-in-Aid for Early-Career Scientists, "Understanding the Relationship between Polymer Structure and Creep Deformation/Failure by Multiscale Analysis," **¥3.2M** ($21,000-$27,000), **PI**.

2020-2021 Japan Science and Technology Agency (JST) Cross-Ministerial Strategic Innovation Promotion Program (SIP), "Materials Integration for Revolutionary Design System of Structural Materials," **technical support** *(PI: K. Naito, NIMS)*; collaborators include Toray Industries.

2020-2021 National Institute for Materials Science (NIMS) Early-Career Research Acceleration Program, *start-up funds for select researchers*, **¥20M** ($130,000-$170,000).

2019-2022 Japan Science and Technology Agency (JST) Center of Innovation Program (COI), "Construction of Next-generation Infrastructure Systems using Innovative Materials," **¥42M** ($300,000-$360,000), **co-PI** *(PI: K. Naito, NIMS)*; collaborators include Komatsu Matere Co.

2013-2016 Virginia Department of Transportation (VDOT) State Project, "Carbon Fiber Reinforced Polymer (CFRP) for Pretension Applications: Material Acceptance Criteria and Advancing Anchorage Designs," **$140,000**, **co-PI** *(PI: S. Sharp, VTRC)*.

AWARDS • HONORS

2023 Selected Paper, *Bulletin of the Chemical Society of Japan (BCSJ).*
Nominated for BCSJ best paper award, accompanied by invited frontispiece.

2015-2019 Graduate Research Fellowship, *Embassy recommendation (acceptance rate: ~9%)*
Ministry of Education, Culture, Sports, Science & Technology (MEXT), Japan

2012-2013 Dean's List of Distinguished Students, *School of Engineering and Applied Sciences*
University of Virginia

TECHNICAL SKILLS • CERTIFICATIONS

- **Synthesis/modification techniques:** Ring-opening polymerization, photo-polymerization (ATRP), condensation polymerization, thiol/disulfide chemistry (metathesis, redox).
- **Processing/fabrication techniques:** Compression molding, injection molding, film extrusion, reactive extrusion, roll milling, doctor blading, spin coating, filtration, wet hand layup, sonication, spray deposition.
- **Characterization techniques:** Spectroscopy (FTIR, UV-vis, Raman, XPS, EDS), microscopy (SEM, AFM), thermal analysis (DSC, TGA, DMA), X-ray diffraction/scattering, nano/micromechanical testing.
- **Modeling/analysis:** First-principles calculations (Orca), finite element analysis (Abaqus).
- **Engineer in Training (EIT)** certification (2013).
- **Japanese language:** professional proficiency (JLPT N2, 2018).

PROFESSIONAL SERVICE

Conference organizing committee: Materials Mechanics Conference M&M2023, Tsukuba University (2023).

Conference session organizer: Society for Experimental Mechanics (SEM) Annual Conference (2015-2017).

Journal reviewer: Angewandte Chemie, ACS Applied Polymer Materials, ChemSusChem, Cellulose, Polymer Degradation and Stability, Polymer Engineering & Science, Composites Part A, Composites Part B, Journal of Polymers and the Environment, Wood Science and Technology.

MENTORING • TEACHING

Research mentor, National Institute for Materials Science:

- Ayumu Morita, *graduate student, Waseda University* 2025-2027
  With support from Prof. Arao, I co-supervise Ayumu's research on melt-mixing methods for preparing thermally conductive polymers (patent and paper in preparation).
- Junhao Wang, *graduate student, Waseda University* 2024-2025
  In close collaboration with Prof. Arao, I co-supervise Junhao's research on graphite/cellulose functional composite films, particularly regarding microstructure and thermal conductivity (paper submitted).
- Tatsuya Akagawa, *graduate student, Hosei University* 2022-2024
  I instructed Tatsuya on material characterization of thermoplastic/biomass compounds, particularly polyamide degradation and viscoelastic analysis; currently a materials engineer.
- Dr. Yuta Tobata, *post-doctoral associate, NIMS* 2021-2023
  I supervised Yuta on fracture energy analysis of fiber reinforced composite rods as part of the COI project (journal [4,9,12]); currently a post-doctoral associate at QST.

Research mentor, University of Virginia/VTRC:

- Katherine Rader, *undergraduate student in Civil Engineering, UVA* 2014-2015
  Kate worked with me on implementing an accelerated creep testing protocol for carbon fiber composites (journal [25] and conference [8]); currently a staff scientist at PNNL.
- Constance Tan, *undergraduate student in Materials Science, UVA* 2013-2014
  I taught Constance sample preparation/polishing and microscopy techniques for characterizing fiber reinforced composites (conference [11]); currently a marketing professional and entrepreneur.

Capstone project/engineering competition supervisor, University of Virginia:

- ASCE/AISC Student Steel Bridge Competition, *Virginias Regional Competition* 2013-2014
  Instructed undergraduate students in structural design (stress analysis, shape optimization) and steel fabrication (arc welding, cutting/grinding, assembly), and served as volunteer staff at the competition.

PUBLICATIONS *(*corresponding author; #graduate / †undergraduate author)* *h*-index: 12 *(Scopus)*

Refereed Journals

1. **J Tanks***, K Tamura*. Room-temperature material recycling/upcycling of polyamide waste enabled by cosolvent-tunable dissolution kinetics. *Angewandte Chemie International Edition*, **2025**, 64, e202502474.
2. **J Tanks***, T Akagawa#, K Tamura*, Y Nemoto, K Naito, Y Watanabe, TT Nge, T Yamada. Enhancing the thermo-oxidative stability of polyamide 6 by scalable melt-blending with PEG-grafted glycol lignin. *Polymer*, **2025**, 335, 128853.
3. S Kawasaki*, K Naito, **J Tanks**. Rapid thermal degradation of polyamide 6 microdroplets and its effect on interfacial shear strength to simulate thermal welding conditions of CFRTP. *Composites Science and Technology*, **2025**, 270, 111318.
4. K Tamura*, **J Tanks**, D Niizeki#, Y Watanabe, T Kogure, H Sakuma, M Kamon. Heavy metal ion adsorption mechanism of polysulfide-modified layered double hydroxide. *Applied Clay Science*, **2025**, 269, 107759.
5. J Wang#, H Lin†, **J Tanks**, Y Arao*. Large-area high thermal conductivity graphite film easily produced by mechanical exfoliation of natural graphite using a three-roll mill. *Composites Part C*, **2025**, 17, 100580.

6. **J Tanks**[*], K Tamura, K Naito, TT Nge, T Yamada. Durable and recyclable biomimetic glycol lignin/polyolefin compounds for a circular economy. *Journal of Materials Chemistry A*, **2024**, 12, 3014-3025.
7. Y Tobata[*], K Naito, **J Tanks**. Mode I-governed fracture energy and maximum normal traction of a CFRP rod. *Journal of Composite Materials*, **2024**, 58, 317-326.
8. **J Tanks**[*], K Tamura, K Naito, TT Nge, T Yamada. Glycol lignin/MAH-*g*-PP blends and composites with exceptional mechanical properties for automotive applications. *Composites Science and Technology*, **2023**, 238, 110030.
9. **J Tanks**[*], K Naito, K Tamura. Rigid epoxy networks with very high intrinsic fracture toughness using a piperazine-based in-situ polymerization strategy. *Materials Letters*, **2023**, 335, 133821.
10. **J Tanks**[*], T Hiroi, K Tamura, K Naito. Tethering organic disulfides to layered silicates: A versatile strategy for photo-controllable dynamic chemistry and functionalization. *Bulletin of the Chemical Society of Japan*, **2023**, 96, 65-71. **[Selected Paper]**, *frontispiece*
11. Y Tobata[*], K Naito, **J Tanks**. Direct measurement and verification of cohesive zone model for basalt/PP rods using the transverse tensile test and virtual double cantilever beam test. *Polymer Composites*, **2023**, 44, 954-962.
12. **J Tanks**[*], K Naito. UV durability assessment of a thermoplastic epoxy-based hybrid composite rod for structural reinforcement and retrofitting. *Journal of Building Engineering*, **2022**, 48, 103922.
13. **J Tanks**[*], Y Arao, M Kubouchi. Network-level analysis of damage in amine-crosslinked diglycidyl ether resins degraded by acid. *Express Polymer Letters*, **2022**, 16, 488-499.
14. Y Tobata[*], K Naito, **J Tanks**. Investigation of a critical separation criterion for mode I-governed fracture of basalt fiber/polypropylene rods via a modified double cantilever beam test. *Composite Structures*, **2022**, 279, 114778.
15. **J Tanks**[*], K Naito, H Ueda. Characterization of the static, creep, and fatigue tensile behavior of basalt fiber/polypropylene composite rods for passive concrete reinforcement. *Polymers*, **2021**, 13, 3136.
16. S Takeda[*], **J Tanks**, S Sugimoto, Y Iwahori. Application of sheet-like energy directors to ultrasonic welding of carbon fibre-reinforced thermoplastics. *Advanced Composite Materials*, **2021**, 30, 192-204.
17. Y Arao[*], **J Tanks**, K Aida[#], M Kubouchi. Exfoliation behavior of large anionic graphite flakes in liquid produced by salt-assisted ball milling. *Processes*, **2020**, 8, 28.
18. Y Arao[*], **J Tanks**, K Aida[†], M Kubouchi. Mechanochemical reaction using weak acid salts enables dispersion and exfoliation of nanomaterials in polar solvents. *Journal of Materials Science*, **2019**, 54, 4546-4558.
19. Y Arao[*], **J Tanks**, M Kubouchi, A. Ito, A. Hosoi, H. Kawada. Direct exfoliation of layered materials in low-boiling point solvents using weak acid salts. *Carbon*, **2019**, 142, 261-268.
20. Y Arao[*], R Kuwahara, K Ohno, **J Tanks**, K Aida[†], M Kubouchi, S Takeda. Mass production of low-boiling point solvent- and water-soluble graphene by simple salt-assisted ball milling. *Nanoscale Advances*, **2019**, 1, 4955-4964.
21. **J Tanks**[*], M Kubouchi, Y Arao. Influence of network structure on the degradation of poly(ether)amine-cured epoxy resins by inorganic acid. *Polymer Degradation and Stability*, **2018**, 157, 153-159.
22. MM Sherif[*], EM Khakimova, **J Tanks**, O Ozbulut[*]. Cyclic flexural behavior of hybrid SMA/steel fiber reinforced concrete analyzed by optical and acoustic techniques. *Composite Structures*, **2018**, 201, 248-260.
23. **J Tanks**[*], Y Arao, M Kubouchi. Diffusion kinetics, swelling, and degradation of corrosion-resistant C-glass/epoxy woven composites in harsh environments. *Composite Structures*, **2018**, 202, 686-694.
24. MM Sherif[*], **J Tanks**, O Ozbulut[*]. Acoustic emission analysis of cyclically loaded superelastic shape memory alloy fiber reinforced mortar beams. *Cement and Concrete Research*, **2017**, 95, 178-187.
25. **J Tanks**[*], SR Sharp, DK Harris. Kinetics of in-plane shear degradation in carbon/epoxy rods from exposure to alkaline and saline environments. *Composites Part B: Engineering*, **2017**, 110, 204-212.
26. **J Tanks**[*], KE Rader[†], SR Sharp, T Sakai. Accelerated creep and creep-rupture testing of carbon fiber laminates using the stepped isostress method. *Composite Structures*, **2017**, 159, 455-462.

27. **J Tanks**[*], SR Sharp, DK Harris, C Ozyildirim. Durability of CFRP cables exposed to concrete environments. *Advanced Composite Materials*, **2017**, 26, 245-258.
28. **J Tanks**[*], DK Harris, SR Sharp. Mechanical response of unidirectional composite bars loaded in transverse compression. *Composites Part B: Engineering*, **2016**, 97, 18-25.
29. **J Tanks**[*], SR Sharp, DK Harris. Charpy impact testing to assess the quality and durability of CFRP rods. *Polymer Testing*, **2016**, 51, 63-68.

Reviews • Perspectives • Commentaries

1. **J Tanks**[*], K Tamura, K Naito. Strengthening lightweight composites with lignin biomacromolecules. *Metals and Materials* (in Japanese), **2026**, 96.
2. K Tamura[*], **J Tanks**. Development of novel biomass-polymer composite materials and plastic recycling technologies. *Bulletin of the Japan Electronic Materials Society* (in Japanese), **2025**, 60.
3. **J Tanks**[*], K Tamura. Fillers for improving functionality and performance in polymeric materials. *Reinforced Plastics* (in Japanese), **2025**, 71, 437-440.
4. **J Tanks**[*], Y Arao, M Kubouchi. Application of CFRP cables to highly durable concrete structures. *Reinforced Plastics* (in Japanese), **2017**, 63, 327-332.

Invited Lectures • Seminars

1. **J Tanks**. "Material Recycling/Upcycling Technologies for Sustainable Polymer Composites". Innovation Campus Lecture, BASF – Network for Asian Open Research, Virtual. June 27, 2025. *Invited speaker*.
2. **J Tanks**. "Multiscale analysis of polymer degradation and lifecycle prediction of composites" (in Japanese). Chemical and Materials Science Seminar, Technical Information Institute, Virtual. Nov 12, 2024. *Invited speaker*.
3. **J Tanks**. "Development of modified lignin thermoplastic composites" (in Japanese). Collegium for Frontier Composite Sciences – Young Researcher Group, Tokyo. June 17, 2024. *Invited speaker*.

Refereed Conference Proceedings

1. **J Tanks**, K Tamura, K Naito, TT Nge, T Yamada. Development of high-performance biomass composites using a PA11/glycol lignin matrix. 24th International Conference on Composite Materials (ICCM24), Baltimore (2025).
2. **J Tanks**, K Naito, H Oguma. A new hybrid FRP reinforcing/prestressing cable for transportation structures. 99th Annual TRB Meeting, Washington, DC (2020).
3. **J Tanks**, Y Arao, M Kubouchi. Coupled diffusion/large-deformation behavior of epoxy matrix resin in corrosive environments. ASC 33rd Technical Conference, Seattle (2018).
4. S Takeda, **J Tanks**, S Sugimoto, Y Iwahori. Application of mesh sheet energy directors to ultrasonic welding and single lap joint strength of CF/PPS composites. 18th European Conference on Composite Materials (ECCM18), Athens (2018).
5. **J Tanks**, SR Sharp, DK Harris, HC Ozyildirim. Durability of carbon fiber reinforced polymer (CFRP) strands in a concrete environment. 95th Annual TRB Meeting, Washington, DC (2016).
6. EM Khakimova, MM Sherif, **J Tanks**, O Ozbulut, DK Harris, C Ozyildirim. Feasibility of using shape memory alloys as fiber reinforcement in concrete. 95th Annual TRB Meeting, Washington, DC (2016).
7. MS Amine, **J Tanks**, DK Harris, M Head. Environmental effects on material and bond durability of CFRP and AFRP for prestressed concrete bridge applications. SEI Structures Congress 2015, Portland (2015).
8. **J Tanks**, KE Rader, SR Sharp. Accelerated creep testing of CFRP with the stepped isostress method. SEM 2015 Annual Conference (SEM), Costa Mesa (2015).
9. **J Tanks**, SR Sharp. Characterization of a stainless-clad steel reinforcing bar. 94th Annual TRB Meeting, Washington, DC (2015).

10. **J Tanks**, SR Sharp. Deformation of CFRP rods with different surface profiles under transverse compressive loading. ASC 29th Technical Conference, San Diego (2014).
11. **J Tanks**, H Tan, SR Sharp. Micro-scale characterization of carbon fiber reinforced polymer composites: Observations, challenges, and practical guidelines. Composites and Advanced Materials Expo (CAMX 2014), Orlando (2014).
12. **J Tanks**, SR Sharp. Short-term hygrothermal aging to simulate a concrete curing environment for pultruded carbon fiber reinforced polymer reinforcing bars. Composites and Advanced Materials Expo (CAMX 2014), Orlando (2014).
13. S Sharp, **J Tanks**, EJ Bradshaw, HC Ozyildirim. Monitoring and inspecting precast piles with carbon fiber reinforced polymer (CFRP) prestressing cables during cold-weather casting. NDE/NDT for Highways & Bridges: Structural Materials Technology (SMT 2014), Washington, DC (2014).

Oral • Poster Presentations

1. **J Tanks**, K Tamura, K Naito. Development of a highly thermally conductive polymer and its nanocomposites. 73rd Symposium on Macromolecules, Niigata (2024).
2. **J Tanks**, K Tamura, K Naito. Highly thermally conductive polymer with tunable mechanical properties. 33rd Polymer Materials Forum, Kyoto (2024).
3. **J Tanks**, K Tamura, K Naito. Development of polypropylene/biomass composites with exceptional mechanical properties. 14th Japan Conference on Composite Materials, Tokyo (2023).
4. **J Tanks**, K Naito, K Tamura. Study on the fracture toughness of thermosetting epoxy alloys. 71st Symposium on Macromolecules, Sapporo (2022).
5. Y Arao, K Aida, **J Tanks**, M Kubouchi. Production of anionic graphite for ultra-high exfoliation in liquid. Okinawa Colloids 2019, Okinawa (2019).
6. K Naito, H Oguma, **J Tanks**, K Uzawa. Tensile properties of hybrid rods and ropes under static and fatigue loading. 16th Japan International SAMPE Symposium and Exhibition (JISSE16), Tokyo (2019).
7. L Wang, **J Tanks**, Y Arao, M Kubouchi. Glass/epoxy laminates modified with edge-functionalized graphene. 16th Japan International SAMPE Symposium and Exhibition (JISSE16), Tokyo (2019).
8. K Naito, C Nagai, H Oguma, **J Tanks**. Shear properties of discontinuous long-carbon fiber reinforced thermoplastic composite. 5th International Conference on Mechanics of Composites (MECHCOMP 2019), Lisbon (2019).
9. M Sato, **J Tanks**, J Koyanagi. Lifetime prediction of viscoelastic material considering entropy damage and non-linear viscoelastic/plastic constitutive equation. 5th International Conference on Mechanics of Composites (MECHCOMP 2019), Lisbon (2019).
10. **J Tanks**, M Kubouchi, Y Arao. Degradation mechanism and non-Fickian mass transport of strong acid in amine-crosslinked epoxy resin. 10th International Conference of Modification, Degradation and Stabilization of Polymers (MoDeSt), Tokyo (2018).
11. **J Tanks**, Y Arao, M Kubouchi. Fracture toughness of epoxy/glass composites exposed to sulfuric acid environment. 10th Japan Conference for Composite Materials (JCCM-10), Kyoto (2018).
12. **J Tanks**, M Kubouchi, Y Arao. Effect of stress on the diffusion mechanism of sulfuric acid in epoxy-based structural composites. 20th International Conference on Composite Structures (ICCS20), Paris (2017).
13. **J Tanks**, M Kubouchi, Y Arao. Dimensional stability and diffusion kinetics of epoxy composites immersed in acidic solutions. 4th Japan-Korea International Symposium on Materials Science and Technology (JKMST 2017), Osaka (2017).
14. **J Tanks**, SR Sharp, DK Harris, M Kubouchi, Y Arao. Hygrothermal durability model for moisture-controlled strength of CFRP rods. 10th Asian-Australasian Conference on Composite Materials (ACCM-10), Busan (2016).

PATENTS *(English translations in parentheses)*

Pending

1. Patent app. 2025-107941, Filed 2025/6/26, “Resin composition, resin pellet, and its molded parts,” K Tamura, H Sakuma, **J Tanks**. (in Japanese)
2. Patent app. 2024-39420, Filed 2024/3/13, “Recycling method for polyamide composite materials,” **J Tanks**, K Tamura. (in Japanese)
3. Patent app. 2023-199474, Filed 2023/11/24, “Thermally conductive epoxy-based thermoplastic resin, its molded parts, and electronic devices using it,” **J Tanks**, K Tamura, K Naito. (in Japanese)
4. Patent app. 2023-195565, Filed 2023/11/17, “Polyamide compounds containing lignin, and their molded parts,” K Tamura, **J Tanks**, K Naito, 4 others. (in Japanese)
5. Patent app. 2022-147633, Filed 2022/9/16, “Polyolefin compounds containing lignin, and their molded parts,” K Tamura, **J Tanks**, K Naito, 3 others. (in Japanese)

Granted

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